

Pat.Appln.Nr 09/872,990

Docket 437-01US

Claims, as amended
In response to O/A dated 11 December 2002

*Claims now cancelled: 6,7**Claims now amended: 1**New claims now added: 29,30**Claims previously withdrawn from consideration: 20-28*

- 1 (now amended). A method for reducing sludge viscosity of a sewage sludge having a solids concentration of at least ten percent by weight, comprising the steps of:
- (a) increasing the pH of the sludge to the range of 9.5 to 12.5;
 - (b) selecting at least one step from
 - (i) maintaining the sludge at the pH of (a) and at a temperature of 10°C to 37°C for a period of at least one day, and
 - (ii) adding one or more inorganic or organic chemicals to the sludge, such chemicals contributing to viscosity reduction;
 - (c) incubating the sludge by maintaining the resultant sludge at a temperature in the range of 40°C to 100°C for a period of time of at least one hour;
 - (d) subjecting the sludge to physical shearing or disintegration; ~~and~~
 - (e) subsequently discharging the sludge;
- and carrying out the step (d) no later than simultaneously with the step (c).
- 2 (original). The method of claim 1 in which step (b)(i) is selected.
- 3 (original). The method of claim 1 in which step (b)(ii) is selected.
- 4 (original). The method of claim 1 in which both step (b)(i) and step (b)(ii) are selected.
- 5 (original). The method of claim 1 in which at least one of a sodium or potassium salt is added in step (b)(ii).
- 6,7. (now cancelled)
- 8 (original). The method of claim 5 in which the salt is at least one of sodium or potassium chloride.
- 9 (original). The method of claim 1 in which an oxidizing agent is added in step (b)(ii).
- 10 (original). The method of claim 9 in which the oxidizing agent is selected from the group consisting of oxygen, chlorine, perchlorate, perchlorite, hydrogen peroxide, nitric acid, sulphuric acid, potassium permanganate, sodium perborate and ozone.
- 11 (original). The method of claim 1 in which the solids concentration of at least ten percent is obtained using a screw press, belt press or a centrifuge.
- 12 (original). The method of claim 1 in which the sludge pH is adjusted to 10.5-11.5.
- 13 (original). The method of claim 1 in which the pH of the sludge is adjusted to at least 12 for 2 h and then to at least 11.5 for 22 h.
- 14 (original). The method of claim 1 in which the sludge is held in step (c) at a temperature and for a time sufficient to eliminate microbial pathogens.
- 15 (original). The method of claim 1 in which the pH is increased using a mono or divalent hydroxide.

16 (original). The method of claim 15 in which the pH is increased using lime.

17 (original). The method of claim 1 in which some or all of the shearing of step (d) is effected by the action of pumps.

18 (original). The method of claim 1 in which at least one of the treatments occurs in a batch procedure.

19 (original). The method of claim 1 in which at least one of the treatments occurs in a continuous procedure.

20 (now re-presented). A low viscosity sewage sludge prepared according to the method of claim 1.

21 (now re-presented). The low viscosity sewage sludge of claim 20 that has been further processed by physical, chemical and/or biological methods.

22 (now re-presented). A low viscosity sludge concentrate produced by the method of claim 20 which has a viscosity suitable for application of the sludge to land by spraying, injection or other methods.

23 (now re-presented). A low viscosity sewage sludge prepared by the method of claim 20 that is suitable for disposal.

24-28 (withdrawn).

29 (new). Apparatus of claim 1, wherein the shearing is done vigorously enough to ensure substantial physical breakdown of cells, thereby releasing water from the cells.

30 (new). Apparatus of claim 1, including carrying out the step (d) sequentially after the step (a).

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cont.